

Institute of Paper Science and Technology  
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## CONTINUOUS BASELINE STUDY

Project 1108-13

Progress Report 138

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

December 1, 1958

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

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# THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

## PART I: PRESENTATION AND DISCUSSION OF RESULTS OBTAINED AT THE INSTITUTE OF PAPER CHEMISTRY

In conjunction with the F.K.I. Continuous Baseline Study, The Institute of Paper Chemistry has been directed to identify the participating mills by means of a scrambled system of code letters. Under this system, which was initiated in Progress Report 105, each mill is identified by a code letter different from that used for the previous month.

During the month of November, eighty-one different sample lots of 42-lb. Fourdrinier kraft linerboard from fifteen different F.K.I. mills were processed at The Institute of Paper Chemistry. A tabulation of the number of samples classified according to mill may be seen in Table I.

These sample lots were tested for basis weight, caliper, bursting strength, and Elmendorf tear. The average strength results for each mill may be seen in Table II and are graphically presented in Figures 1 to 5. In addition to a comparison of the mill averages for the various tests, Table II also shows the current F.K.I. averages, the cumulative F.K.I. averages, and the F.K.I. indexes. The cumulative F.K.I. average is based on the results for the previous twelve months excluding the current period. Hence, in the case of the current report, it covers the period from November 1, 1957 to October 31, 1958. The F.K.I. indexes are obtained as follows:

$$\frac{\text{current F.K.I. average}}{\text{cumulative F.K.I. average}} \times 100 = \text{F.K.I. index (\%)}$$

TABLE I  
NUMBER OF SAMPLE LOTS SUBMITTED BY EACH MILL

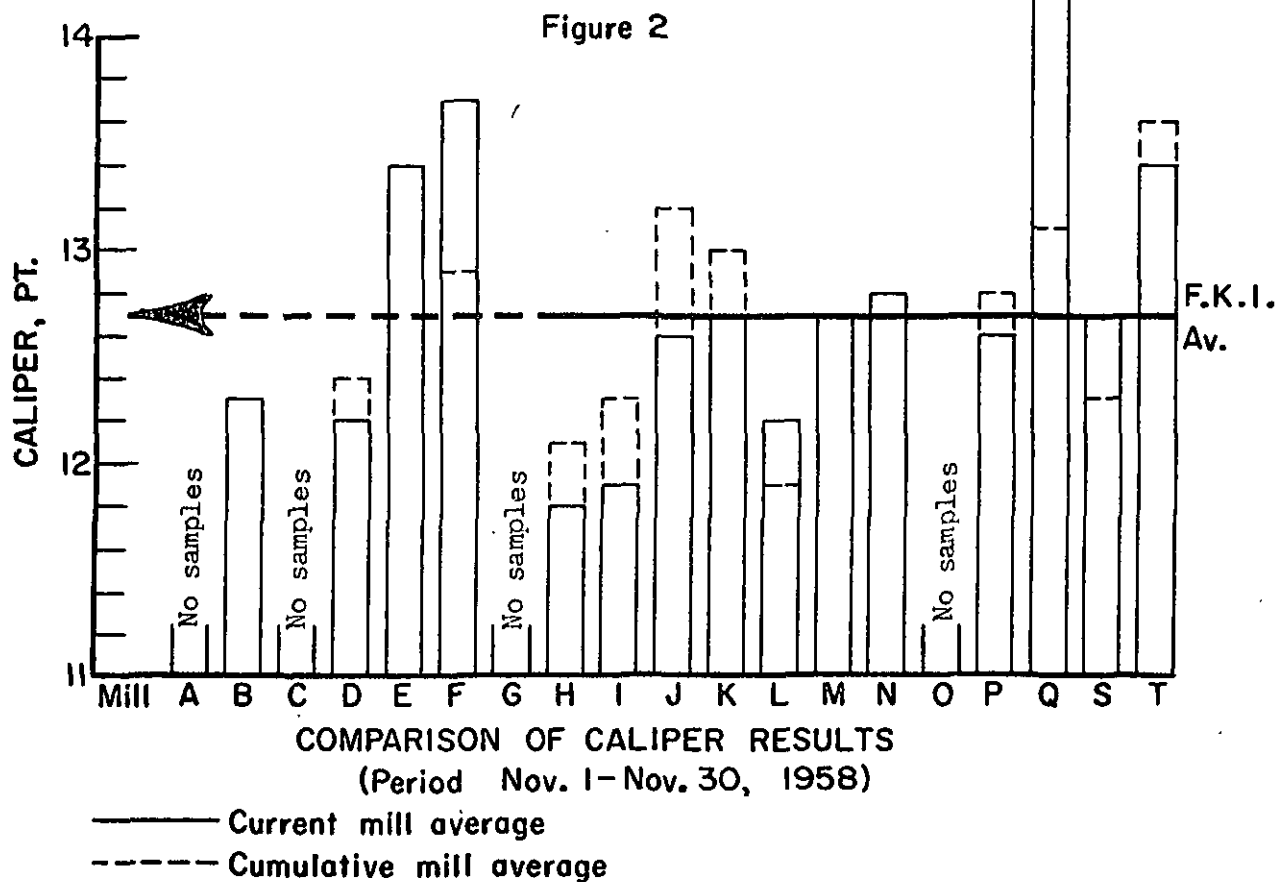
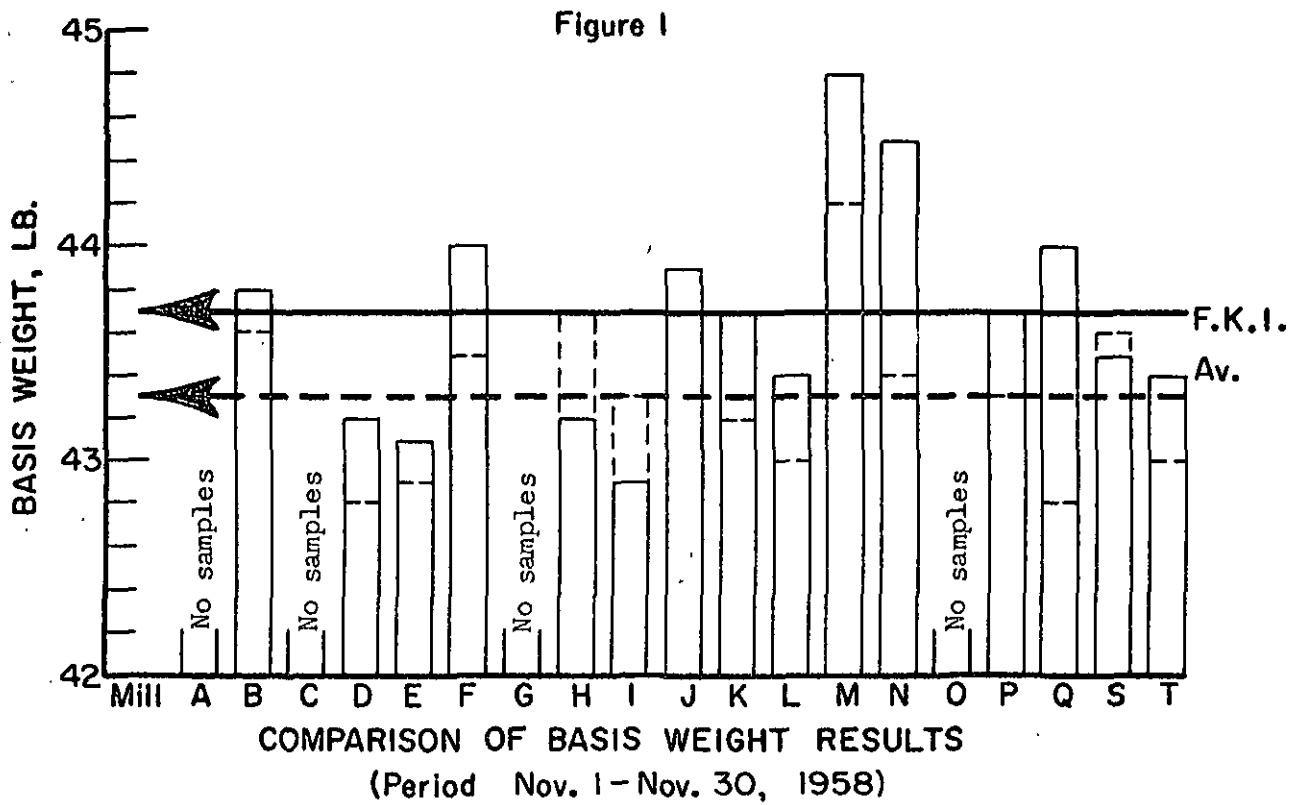
Mill Code	Number
A	0
B	8
C	0
D	3
E	8
F	7
G	0
H	2
I	6
J	6
K	6
L	6
M	9
N	5
O	0
P	6
Q	1
S	2
T	6
Total	<hr/> 81

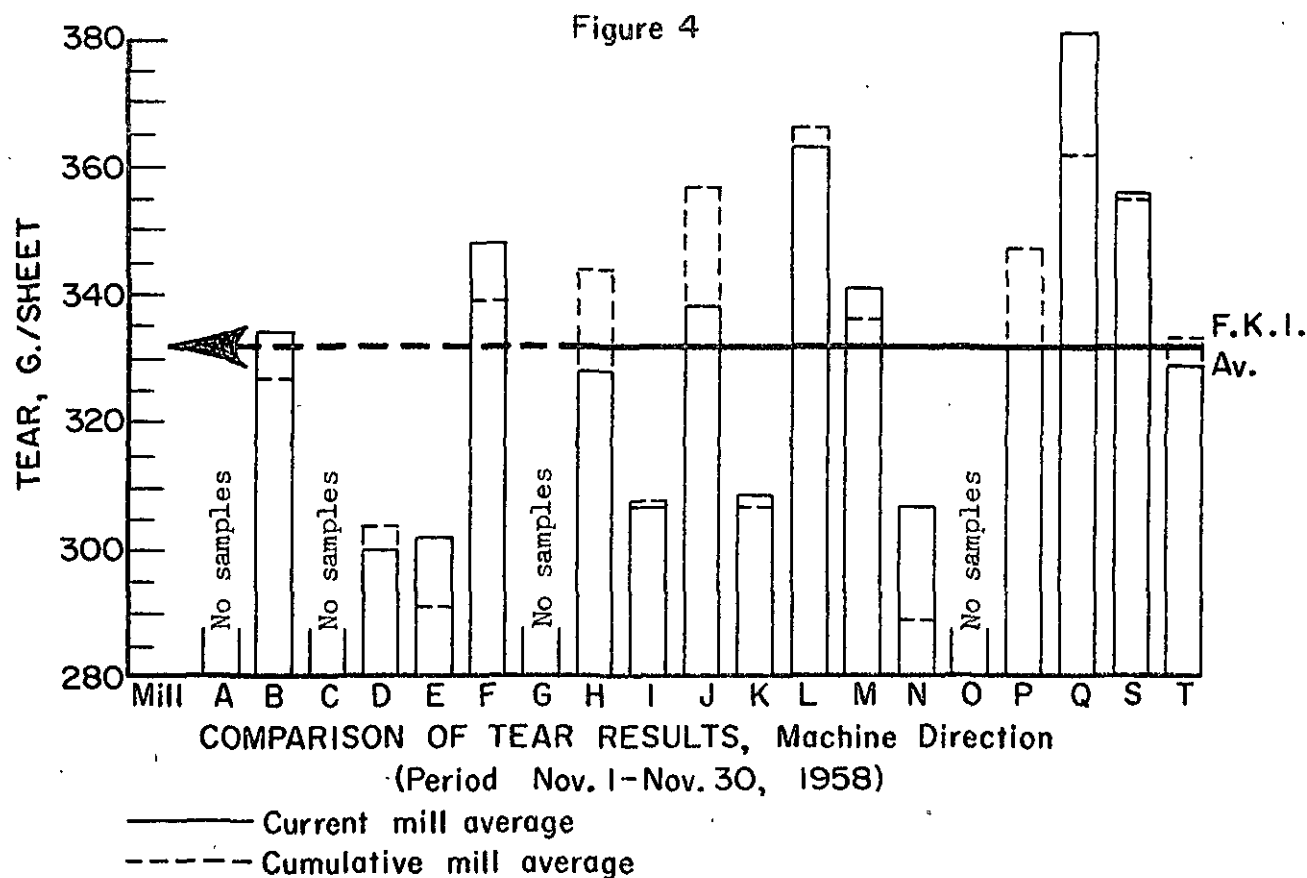
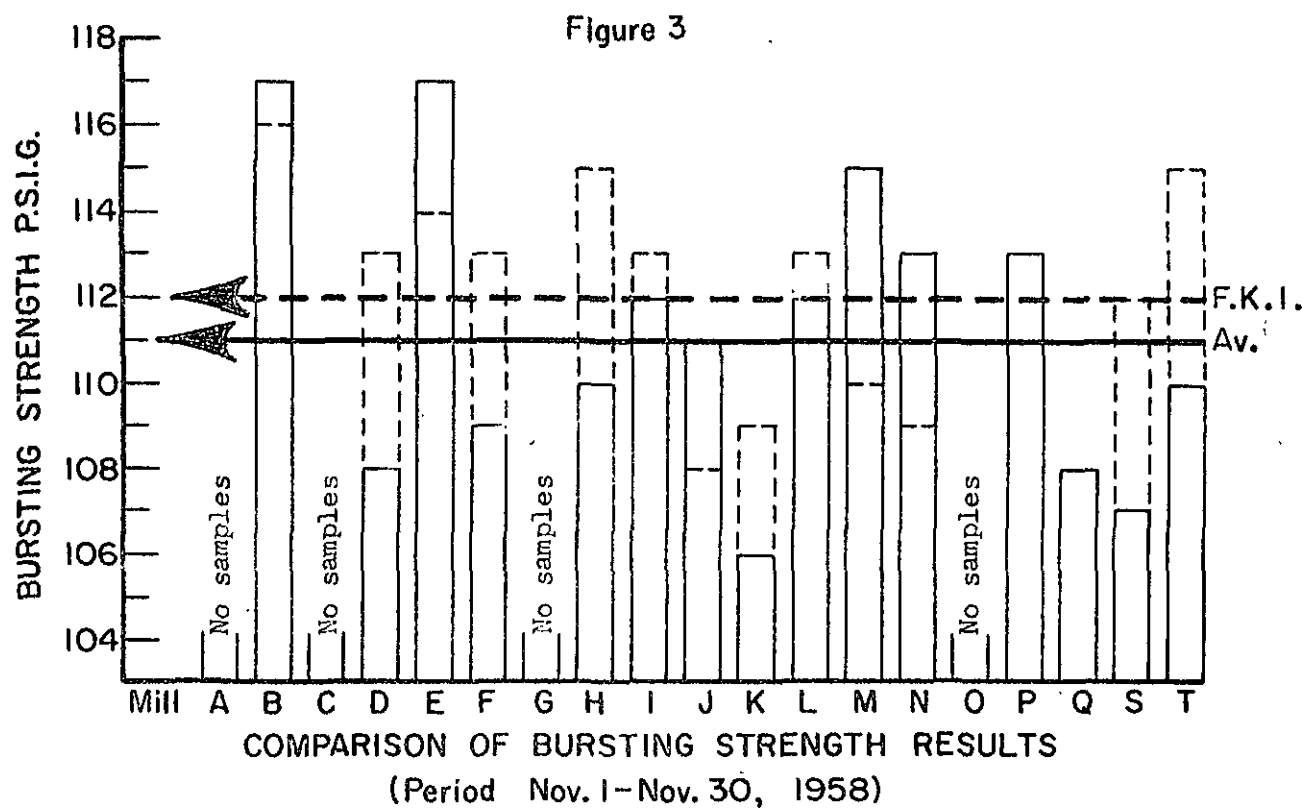
TABLE II

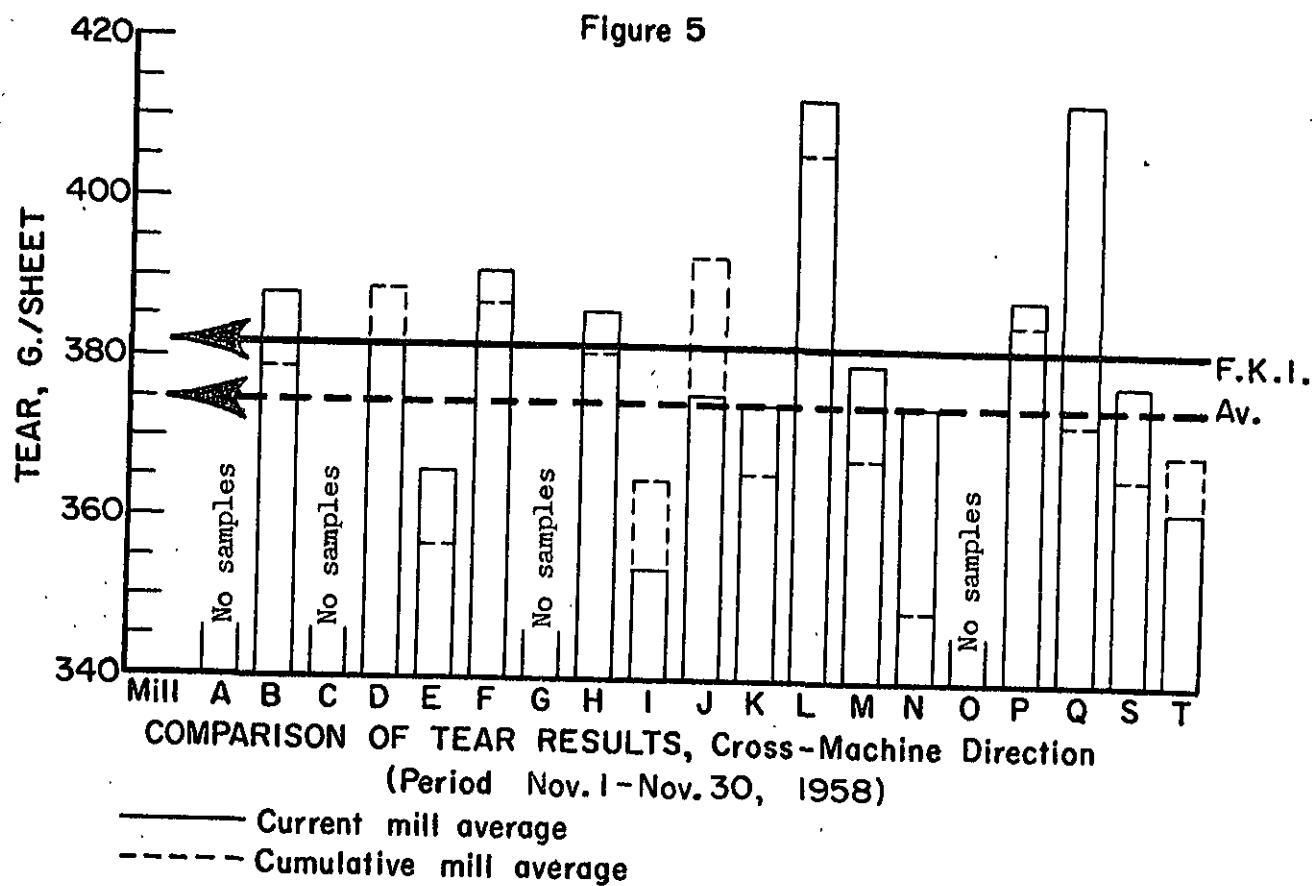
SUMMARY OF COMPOSITE MILL AVERAGES--NOVEMBER 1 THROUGH NOVEMBER 30, 1958

Mill	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. gage	Elmendorf Tear, g./sheet	
				In Machine	Cross Machine
A	No samples submitted.	12.3	117	334	388
B	43.8				
C	No samples submitted.	12.2	108	300	382
D	43.2				
E	43.1	13.4	117	302	366
F	44.0	13.7	109	348	391
G	No samples submitted.				
H	43.2	11.8	110	328	386
I	42.9	11.9	112	307	354
J	43.9	12.6	111	338	376
K	43.7	12.7	106	309	375
L	43.4	12.2	112	363	413
M	44.8	12.7	115	341	380
N	44.5	12.8	113	307	375
O	No samples submitted.				
P	43.7	12.6	113	332	388
Q	44.0	14.2	108	381	413
S	43.5	12.7	107	356	378
T	43.4	13.4	110	329	362
Current FKI Average:	43.7	12.7	111	332	382
Cumulative FKI Average:	43.3	12.7	112	332	375
FKI Index, %	100.9	100.0	99.1	100.0	101.9









The F.K.I. index provides a ready means of comparing the current quality with previous results. For example, the current F.K.I. average basis weight is 43.7 lb., and the cumulative F.K.I. average basis weight is 43.3 lb. Hence, the F.K.I. index for basis weight determined in per cent as indicated above is 100.9% and signifies that the current F.K.I. average basis weight is higher than the cumulative F.K.I. average.

A comparison of the results in Table II and Figure 1 shows that the average basis weight results for all mills conform to the 42-lb. specification set forth in Rule 41. Mill M had the highest average basis weight of 44.8 lb. which was approximately 6.7% higher than the 42-lb. specification. The lowest average basis weight of 42.9 lb., which was approximately 2.1% higher than the 42-lb. specification, was associated with Mill I.

The amount by which the mills vary from the 42-lb. specification is shown in Table II-A.

A comparison of the current F.K.I. basis weight average for this period with that for the previous period shows that basis weight is slightly higher for the current period.

A comparison of the average caliper values for the various mills (see Figure 2) shows that the current mill averages varied from a low of 11.8 points for Mill H to a high of 14.2 points for Mill Q. The current F.K.I. caliper average is 12.7 points, which is the same as the cumulative F.K.I. average.

TABLE II-A  
PERCENTAGE DEVIATIONS FROM 42-LB. BASIS WEIGHT  
SPECIFICATION

Mill Code	Per Cent
A	--
B	+4.3
C	--
D	+2.9
E	+2.6
F	+4.8
G	--
H	+2.9
I	+2.1
J	+4.5
K	+4.0
L	+3.3
M	+6.7
N	+6.0
O	--
P	+4.0
Q	+4.8
S	+3.6
T	+3.3

The average bursting strength values obtained for each mill are graphically presented in Figure 3. It may be observed in Table II and Figure 3 that the current mill averages for bursting strength ranged from a low of 106 for Mill K to a high of 117 for Mills B and E. The current F.K.I. bursting strength average is 111 p.s.i. gage, which is slightly lower than the cumulative F.K.I. average of 112 p.s.i. gage.

A graphic comparison of the Elmendorf tear results shown in Table II for the various mills is given in Figures 4 and 5. These presentations show that Mill Q had the highest machine direction tear average of 381 g./sheet, and Mill D had the lowest average of 300 g./sheet. It may be further noted in Table II that the highest cross-machine direction tear average of 413 g./sheet was shared by Mills L and Q and that the lowest average of 354 g./sheet was associated with Mill I. It may be observed also in Table II that the current F.K.I. average for machine direction Elmendorf tear is the same as the cumulative F.K.I. average and the current F.K.I. average for cross-machine direction Elmendorf tear is slightly higher than the cumulative F.K.I. average.

A comparison of the F.K.I. indexes indicates that, for the current period, the current F.K.I. averages for basis weight and cross-machine direction Elmendorf tear are slightly higher than their cumulative F.K.I. averages, the current F.K.I. averages for caliper and machine direction Elmendorf tear are the same as their cumulative F.K.I. averages, and the current F.K.I. average for bursting strength is slightly lower than its cumulative F.K.I. averages.

In order to compare the variation within a given mill, the test results for each particular mill have been tabulated in Tables III to XXI for Mills A through T, respectively.

In addition to the current and cumulative average, the mill factor and mill index are given for each mill. The cumulative mill average is the average test result obtained on the samples submitted by the particular mill for the previous twelve months excluding the current period. The mill factor and the mill index are obtained as follows:

$$\frac{\text{current mill average}}{\text{cumulative mill average}} \times 100 = \text{mill factor (\%)}$$

$$\frac{\text{current mill average}}{\text{cumulative F.K.I. average}} \times 100 = \text{mill index (\%)}$$

The mill factor and the mill index are a convenient means for comparing the current mill results either with the previous results for that particular mill or with the cumulative F.K.I. results. The reports also present a comparison of the test data obtained at the mills with test data obtained at The Institute of Paper Chemistry. These test data are presented and discussed on subsequent pages of this report.

It may be noted in Tables III through XXI that the test data include information about the sheet finish. The summarized results for the mills which submitted sample lots during the current period are shown in Table XXI-A.

SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958

TABLE III

MILL A -- 42-1B. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i.			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.

No samples submitted.

TABLE IV

MILL B -- 42-1B. LINERBOARD

1190380	W.F.	11/ 4/58	10/26/58	2	44.0	43.0	43.8	12.3	11.8	12.0	139	86	117	392	280	323 <sup>a</sup>	392	336	372 <sup>a</sup>
1190381	W.F.	11/ 4/58	10/26/58	2	44.0	43.0	43.4	12.3	11.6	12.0	137	94	118	360	256	300	376	320	350 <sup>a</sup>
1190424	W.F.	11/10/58	11/ 2/58	2	44.8	42.0	43.8	12.5	11.6	12.1	144	100	121	400	298	338	432	368	391 <sup>a</sup>
1190425	W.F.	11/10/58	11/ 2/58	2	45.0	43.2	44.1	12.7	11.8	12.3	139	104	121	368	312	346 <sup>a</sup>	496	376	417 <sup>a</sup>
1190475	W.F.	11/17/58	11/ 9/58	2	44.8	43.0	43.8	12.9	12.0	12.4	138	103	118	400	312	350 <sup>a</sup>	440	368	403 <sup>a</sup>
1190476	W.F.	11/17/58	11/10/58	2	44.8	43.0	43.6	12.8	11.8	12.3	138	100	119	384	296	343 <sup>a</sup>	416	368	391 <sup>a</sup>
1190500	W.F.	11/21/58	11/16/58	2	45.0	43.6	44.1	13.2	12.0	12.5	128	92	113	352	296	327 <sup>a</sup>	432	368	398 <sup>a</sup>
1190501	W.F.	11/21/58	11/16/58	2	44.6	43.6	44.0	12.9	12.1	12.5	131	86	112	392	288	343 <sup>a</sup>	416	352	383 <sup>a</sup>
Current Mill average:					43.8			12.3			117			334			388		
Cumulative Mill average:					43.6			12.3			116			327			379		
Mill Factor, %					100.5			100.0			100.9			102.1			102.4		
Mill Index, %					101.2			96.9			104.5			100.6			103.5		

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.



SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE V

MILL C -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i., gage			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.

No samples submitted.

TABLE VI

MILL D -- 42-LB. LINERBOARD

180376	WFLS	11/ 3/58	10/22/58	1	43.8	42.2	43.0	12.8	12.0	12.2	128	88	111	360	264	308	416	336	391 <sup>a</sup>
180377	WFLS	11/ 3/58	10/27/58	1	44.0	42.8	43.3	13.0	12.0	12.3	129	86	107	360	280	309 <sup>a</sup>	448	336	383 <sup>a</sup>
180378	WFLS	11/ 3/58	10/29/58	1	44.0	42.4	43.2	12.5	11.8	12.1	128	89	107	304	256	283 <sup>a</sup>	408	352	372 <sup>a</sup>
Current Mill Average:					43.2			12.2			108			300			382		
Cumulative Mill Average:					42.8			12.4			113			304			389		
Mill Factor, %					100.9			98.4			95.6			98.7			98.2		
Mill Index, %					99.8			96.1			96.4			90.4			101.9		

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE VII

MILL E -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, P.S.I., gage			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	In	Max.	Across
130427	W.F.	11/10/58	10/20/58	1	43.8	42.4	43.2	14.1	13.0	13.6	136	100	120	320	240	297 <sup>a</sup>
130428	W.F.	11/10/58	10/26/58	1	44.0	42.4	43.2	13.5	12.1	13.0	134	96	117	336	240	301 <sup>a</sup>
130429	W.F.	11/10/58	10/27/58	1	43.8	42.4	43.2	13.8	12.6	13.1	137	98	118	336	272	311 <sup>a</sup>
130430	W.F.	11/10/58	10/30/58	1	44.0	42.0	42.8	14.6	14.0	14.2	134	86	111	312	240	283 <sup>a</sup>
130509	W.F.	11/24/58	11/3/58	1	44.0	42.6	43.5	13.8	13.0	13.5	129	91	113	368	288	325
130510	W.F.	11/24/58	11/6/58	1	43.6	42.0	42.5	14.2	12.9	13.4	138	88	115	328	232	289 <sup>a</sup>
130511	W.F.	11/24/58	11/10/58	1	43.8	42.6	43.0	13.2	12.5	12.9	143	95	120	352	232	301 <sup>a</sup>
130512	W.F.	11/24/58	11/14/58	1	43.8	43.6	43.6	14.2	12.8	13.3	142	83	120	368	280	312
Current Mill Average:					43.1			13.4			117			302		
Cumulative Mill Average:					42.9			13.4			114			291		
Mill Factor, %					100.5			100.0			102.6			103.8		
Mill Index, %					99.5			105.5			104.5			91.0		

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE VIII  
MILL F -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, P.S.I., gage			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
180375	W.F.	11/ 3/58	10/26/58	2	44.0	42.6	43.6	13.2	12.0	12.8	128	89	108	376	280	338
180379	W.F.	11/ 4/58	10/28/58	2	44.2	42.2	43.4	14.0	12.9	13.3	128	86	109	400	288	345 <sup>a</sup>
180414	W.F.	11/10/58	11/ 2/58	2	44.8	43.0	44.0	14.8	13.3	14.0	130	81	110	432	352	382 <sup>a</sup>
180413	WFLS	11/10/58	11/ 4/58	2	44.4	43.6	44.0	14.2	13.3	13.8	133	90	108	384	336	353 <sup>a</sup>
180447	WFLS	11/12/58	11/ 8/58	2	45.4	44.0	44.4	15.2	14.0	14.5	124	80	107	384	272	323 <sup>a</sup>
180507	WFLS	11/24/58	11/13/58	2	45.6	43.2	44.3	14.5	13.0	13.8	127	98	111	384	296	352 <sup>a</sup>
180503	WFLS	11/24/58	11/14/58	2	45.8	43.0	43.9	14.8	13.2	13.9	122	93	108	408	264	344
Current Mill Average:					44.0			13.7			109			348		
Cumulative Mill Average:					43.5			12.9			113			339		
Mill Factor, %					101.1			106.2			96.5			102.7		
Mill Index, %					101.6			107.9			97.3			104.8		

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE IX

MILL G -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet	
					Max.	Av.	Max.	Min.	Max.	Min.	Max.	Min.

No samples submitted.

TABLE X

MILL H -- 42-LB. LINERBOARD

180462	W.F.	11/14/58	11/3/58	-	43.6	41.0	42.2	12.3	10.5	11.4	124	95	108	336	280	310 <sup>a</sup>	408	344	373 <sup>a</sup>
180463	W.F.	11/14/58	11/9/58	-	45.6	43.0	44.2	12.8	11.8	12.3	139	80	112	392	304	346 <sup>a</sup>	448	360	399 <sup>a</sup>
Current Mill Average:							43.2			11.8			110			328			386
Cumulative Mill Average:							43.7			12.1			115			344			381
Mill Factor, %							98.9			97.5			95.7			95.3			101.3
Mill Index, %							99.8			92.9			98.2			98.8			102.9

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XI

MILL I -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i.			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
180371	W.F.	11/ 3/58	10/16/58	2	44.0	42.0	43.1	12.3	11.5	12.0	130	92	115	352	272	318 <sup>a</sup>
180372	W.F.	11/ 3/58	10/16/58	2	44.0	42.6	43.4	12.3	10.5	11.8	142	100	113	352	280	318 <sup>a</sup>
180373	W.F.	11/ 3/58	10/17/58	2	44.0	42.4	43.2	12.1	11.2	11.7	139	96	116	336	272	310 <sup>a</sup>
180374	W.F.	11/ 3/58	10/17/58	2	44.0	42.2	43.0	12.8	11.8	12.2	144	90	114	352	248	305 <sup>a</sup>
180471	W.F.	11/17/58	11/ 5/58	2	43.4	41.8	42.6	12.6	11.0	11.8	127	92	107	344	264	303 <sup>a</sup>
180472	W.F.	11/17/58	11/ 5/58	2	43.0	41.2	42.1	12.5	11.4	12.0	138	89	110	320	264	291 <sup>a</sup>
Current Mill Average:					-	-	42.9	-	-	11.9	-	-	112	-	-	307
Cumulative Mill Average:					-	-	43.3	-	-	12.3	-	-	113	-	-	308
Mill Factor, %					-	-	99.1	-	-	96.7	-	-	99.1	-	-	99.7
Mill Index, %					-	-	99.1	-	-	93.7	-	-	100.0	-	-	92.5
					-	-	-	-	-	-	-	-	-	-	-	354
					-	-	-	-	-	-	-	-	-	-	-	365
					-	-	-	-	-	-	-	-	-	-	-	97.0
					-	-	-	-	-	-	-	-	-	-	-	94.4

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XII  
MILL J -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i., gage			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
130415	W.F.	11/10/58	10/3/58	1	44.0	41.8	42.9	13.0	12.0	12.5	127	90	106	344	272	304 <sup>a</sup>
130416	W.F.	11/10/58	10/10/58	1	44.2	42.6	43.6	13.1	12.2	12.7	123	87	108	368	304	337
130417	W.F.	11/10/58	10/15/58	1	45.6	42.8	44.0	13.0	12.0	12.5	138	78	114	394	272	332
130418	W.F.	11/10/58	10/15/58	1	45.4	43.4	44.3	13.0	12.0	12.4	130	88	111	408	320	369 <sup>a</sup>
130419	W.F.	11/10/58	10/20/58	1	45.6	43.0	44.1	13.0	12.0	12.5	136	97	116	384	320	344
130420	W.F.	11/10/58	10/27/58	1	45.6	43.4	44.4	13.3	12.2	12.7	133	55	110	384	304	341 <sup>a</sup>
Current Mill Average:					43.9			12.6			111			338		
Cumulative Mill Average:					43.7			13.2			108			357		
Mill Factor, %					100.5			95.5			102.8			94.7		
Mill Index, %					101.4			99.2			99.1			101.8		

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XIII  
KILL K -- 42-13, LINERBOARD

File No.	Finish	Date Recd.	Date Made	Coh. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i. gage			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
120322	WFB	11/4/58	10/27/58	1	45.4	42.3	44.2	13.4	12.5	13.0	144	93	108	344	256	308
120323	WFB	11/4/58	10/27/58	1	44.4	43.0	43.9	13.3	12.3	12.9	129	82	104	360	256	311
120324	WFB	11/14/58	10/31/58	1	46.2	41.8	43.6	13.2	12.0	12.6	139	80	106	336	256	291a
120325	WFB	11/14/58	10/31/58	1	45.6	43.0	44.1	13.2	12.1	12.5	130	76	104	344	272	299a
120326	WFB	11/25/58	11/17/58	1	44.2	42.2	43.2	13.0	11.9	12.4	130	78	108	368	264	327a
120327	WFB	11/25/58	11/17/58	1	45.0	41.8	43.3	13.1	11.9	12.6	124	94	104	392	256	317
Current Mill Average:					43.7			12.7			106			309		
Cumulative Mill Average:					43.2			13.0			109			307		
Mill Factor, %					101.2			97.7			97.2			100.7		
Mill Index, %					100.9			100.0			94.6			93.1		

\*This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XIV  
MILL L -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i., gage		Elmendorf Tear, g./sheet		Across	
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
180456	W.B.	11/14/58	10/30/58	-	43.8	41.0	12.2	11.5	130	91	376	328	432	344
180457	W.B.	11/14/58	10/31/58	-	45.0	43.8	13.0	12.0	126	99	424	320	456	392
180458	W.B.	11/14/58	11/4/58	-	45.0	43.0	13.1	12.2	126	100	424	352	464	376
180459	W.B.	11/14/58	11/3/58	-	44.2	42.0	12.6	11.0	119	98	416	344	464	376
180459	W.B.	11/15/58	11/5/58	-	44.2	42.2	12.7	11.0	138	102	384	296	424	376
180490	W.B.	11/16/58	11/5/58	-	43.8	42.2	12.8	11.7	135	100	392	328	464	376
Current Mill Average:					43.4		12.2		112		363		413	
Cumulative Mill Average:					43.0		11.9		113		366		406	
Mill Factor, %					100.9		102.5		99.1		99.2		101.7	
Mill Index, %					100.2		96.1		100.0		109.3		110.1	

Series average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.



SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XV

MILL M -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i. gage			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
180431	W.F.	11/10/58	11/ 5/58	-	47.0	42.0	44.8	13.1	11.8	12.4	136	83	118	376	296	337 <sup>a</sup>
180432	W.F.	11/10/58	11/ 6/58	-	46.0	44.8	45.4	13.0	12.1	12.6	128	87	111	392	320	359 <sup>a</sup>
180433	W.F.	11/10/58	11/ 7/58	-	47.6	45.4	46.6	13.3	12.3	12.8	137	102	123	424	312	379 <sup>a</sup>
180491	W.F.	11/20/58	11/12/58	-	44.4	42.2	43.5	13.5	12.3	13.1	133	88	105	376	296	333 <sup>a</sup>
180492	W.F.	11/20/58	11/13/58	-	45.2	44.0	44.4	13.2	12.3	12.9	135	100	119	368	288	329 <sup>a</sup>
180493	W.F.	11/20/58	11/14/58	-	46.2	45.0	45.5	13.3	12.5	12.9	136	105	120	392	280	344 <sup>a</sup>
180502	W.F.	11/24/58	11/19/58	-	43.0	41.2	42.4	13.2	12.4	12.8	121	90	104	360	280	313 <sup>a</sup>
180503	W.F.	11/24/58	11/20/58	-	46.2	45.6	45.9	12.7	11.7	12.3	138	106	122	392	288	339 <sup>a</sup>
180504	W.F.	11/24/58	11/21/58	-	45.0	44.0	44.4	12.7	12.2	12.4	131	100	112	400	280	338 <sup>a</sup>
Current Mill Average:					44.8			12.7			115			341		
Cumulative Mill Average:					44.2			12.7			110			336		
Mill Factor, %					101.4			100.0			104.5			101.5		
Mill Index, %					103.5			100.0			102.7			102.7		

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XVI  
MILL N -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, P.s.i., gage			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
180370	W.F.	11/ 3/58	10/16/58	1	45.6	43.2	44.2	13.1	12.2	12.6	137	77	110	328	264	301 <sup>a</sup>
180411	W.F.	11/ 6/58	10/23/58	1	46.0	42.8	44.5	13.2	12.5	13.0	130	97	116	336	280	308 <sup>a</sup>
180412	W.F.	11/ 6/58	10/28/58	1	46.0	43.4	44.8	13.3	12.2	12.8	130	90	112	328	248	298 <sup>a</sup>
180421	W.F.	11/10/58	11/ 3/58	1	46.0	42.4	44.6	13.1	12.5	12.9	136	88	113	352	272	318 <sup>a</sup>
180513	W.F.	11/24/58	11/13/58	1	45.4	43.2	44.4	13.1	12.3	12.9	133	88	112	352	272	310
Current Mill Average:					44.5			12.8			113			307		
Cumulative Mill Average:					43.4			12.7			109			289		
Mill Factor, %					102.5			100.8			103.7			106.2		
Mill Index, %					102.8			100.8			100.9			92.5		

TABLE XVII

MILL O -- 42-LB. LINERBOARD

No samples submitted.

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XVIII

MILL P -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i.		Elmendorf Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
180368	W.F.	11/ 3/58	10/12/58	2	43.6	42.8	12.9	12.2	132	74	368	280
180369	W.F.	11/ 3/58	10/23/58	2	43.8	42.2	12.8	12.2	130	84	368	304
180445	W.F.	11/12/58	10/27/58	2	44.0	43.8	12.8	12.0	132	96	400	288
180446	W.F.	11/12/58	10/28/58	2	44.2	43.4	12.9	12.2	136	94	376	272
180505	W.F.	11/24/58	11/ 4/58	2	44.6	43.2	12.9	12.1	142	91	376	288
180506	W.F.	11/24/58	11/ 5/58	2	44.2	43.4	13.8	13.0	136	80	384	272
Current Mill Average:					43.7		12.6		113		332	
Cumulative Mill Average:					43.3		12.8		113		347	
Mill Factor, %					100.9		98.4		100.0		95.7	
Mill Index, %					100.9		99.2		100.9		100.0	
											388	
											385	
											100.8	
											103.5	

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XIX

MILL Q -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, P.S.I., gage		Elmendorf Tear, g./sheet	
					Max.	Min. Av.	Max.	Min. Av.	Max.	Min. Av.	In	Across
180426	W.	11/10/58	10/26/58	2	45.0	42.8 44.0	14.8	13.8 14.2	133	89 108	416	352 381 <sup>a</sup>
Current Mill Average:						44.0		14.2		108		381
Cumulative Mill Average:						42.8		13.1		108		362
Mill Factor, %						102.8		108.4		100.0		105.2
Mill Index, %						101.6		111.8		96.4		114.8
												413
												373
												110.7
												110.1

TABLE XX

MILL S -- 42-LB. LINERBOARD

180422	W.F.	11/10/58	10/14/58	-	44.0	42.0 42.8	13.2	12.1 12.8	126	90 105	496	304 355 <sup>a</sup>	448	320 375 <sup>a</sup>
180423	W.F.	11/10/58	10/14/58	-	45.0	43.4 44.2	13.2	12.1 12.5	138	85 109	384	320 357 <sup>a</sup>	408	352 381 <sup>a</sup>
Current Mill Average:						43.5		12.7		107		356		378
Cumulative Mill Average:						43.6		12.3		112		355		366
Mill Factor, %						99.8		103.3		95.5		100.3		103.3
Mill Index, %						100.5		100.0		95.5		107.2		100.5

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XXI

MILL T -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, P.S.I., gage		Elmendorf Tear, g./sheet		Across	
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
180364	WFLS	11/ 3/58	9/28/58	2	44.0	41.8	13.3	12.3	127	96	116	384	304	346 <sup>a</sup>
180365	WFLS	11/ 3/58	9/29/58	2	45.0	42.6	14.2	13.2	130	90	108	368	296	336 <sup>a</sup>
180366	WFLS	11/ 3/58	10/ 4/58	2	44.2	42.0	13.7	13.0	138	91	112	368	288	332
180367	WFLS	11/ 3/58	10/ 5/58	2	44.0	42.2	14.0	13.2	127	95	109	344	272	305
180473	WFLS	11/17/58	10/ 9/58	2	44.4	42.0	13.6	12.3	143	98	112	384	296	341 <sup>a</sup>
180474	WFLS	11/17/58	10/13/58	2	44.2	43.0	14.2	12.6	131	88	106	360	288	317 <sup>a</sup>
Current Mill Average:					43.4		13.4		110		329		362	
Cumulative Mill Average:					43.0		13.6		115		333		369	
Mill Factor, %					100.9		98.5		95.7		98.8		98.1	
Mill Index, %					100.2		105.5		98.2		99.1		96.5	

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

TABLE XXI-A  
SUMMARY OF SHEET FINISH DATA

Mill Code	(No. of Sample Lots) Finish	
	W.F.	W.F.I.S.
A	No samples submitted.	
B	8	
C	No samples submitted.	
D		3
E	8	
F	3	4
G	No samples submitted.	
H	2	
I	6	
J	6	
K		6
L	6 <sup>a</sup>	
M	9	
N	5	
O	No samples submitted.	
P	6	
Q	1	
S	2	
T		6
Total	62	19

<sup>a</sup> W.B.

PART II. DISCUSSION AND COMPARISON OF RESULTS OBTAINED AT  
THE INSTITUTE OF PAPER CHEMISTRY WITH THOSE OBTAINED AT THE MILLS

As a supplementary part of the Continuous Baseline Study, comparisons of the mill test results with those obtained at The Institute of Paper Chemistry on corresponding samples have been included in this report. As may be noted in Table XXII, the atmospheric conditions used prior to and during the testing period were relatively uniform for the mills which reported this information. However, the preconditioning and conditioning time periods varied considerably.

A summary of the Institute and mill test results for the current period is shown in Table XXIII, and a comparison of differences between Institute and mill test results is given in Table XXIV for the current period and the two previous periods.

A comparison of the test data in Tables XXIII and XXIV reveals the level of agreement between mill and Institute data for basis weight, caliper, bursting strength, and Elmendorf tear. Table XXIII shows the over-all average difference between Institute and mill results for each of these tests based on the data for all sample lots submitted by each mill for the current period. In addition, the maximum difference encountered in comparing the Institute and mill test results for a given sample lot is shown. In Table XXIV, the over-all average differences shown for each test in Table XXIII have been calculated on a percentage basis for each mill. In addition, for purposes of comparison, the average percentage differences for the preceding two periods are shown.

TABLE XXII  
PRECONDITIONING AND CONDITIONING DATA FOR THE MILL TESTS

Mill Code	R.O.H., %	Preconditioning Temperature, °F.	Time, hr.	R.O.H., %	Conditioning Temperature, °F.	Time, hr.
A						
B		None	No samples submitted.	50	73	24
C		None	No samples submitted.	47-48	65-68	--
D						
E		None		56-75	72-86	--
F	50	70-73	24	50	70-73	24
G			No samples submitted.			
H		None		50	73	48
I		73	24	50	73	24
J	50	73	24	50	73	24
K	50	73-74	43-95	50	73-74	2
L		None		45-47	73-74	48
M		78-79	8	48-52	72-73	16
N	34-35	75-79	0.5	50	73	24-48
O	41-62		No samples submitted.			
P		None		50	73	24
Q		None				
S		None		53	73	--
T	50	72	24	50	73	0.5
					None	



TABLE XXIII  
SUMMARY OF TEST RESULT COMPARISONS (AVERAGE MILL AND INSTITUTE RESULTS)

Mills* No. Samples Compared	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	S	T
	0	8	0	3	8	7	0	2	6	6	6	6	9	5	0	6	1	2	6
Institute		43.8		43.2	43.1	44.0		43.2	42.9	43.9	43.7	43.4	44.8	44.5	43.7	44.0	43.5	43.4	
Mill		43.3		42.4	42.0	43.5		42.4	42.8	43.2	42.9	42.3	44.0	43.3	43.1	43.2	43.0	43.6	
Av. Diff.**		-0.5		-0.8	-1.1	-0.5		-0.8	-0.1	-0.7	-0.8	-1.1	-0.8	-1.2	-0.6	-0.8	-0.5	+0.2	
Max. Diff.***		-1.0		-0.8	-1.6	-0.7		-0.9	-0.4	-1.0	-1.6	-1.2	-3.4	-1.9	-1.1	-0.8	-0.6	-0.9	
<u>Basis Weight</u>																			
Institute		12.3		12.2	13.4	13.7		11.8	11.9	12.6	12.7	12.2	12.7	12.8	12.6	14.2	12.7	13.4	
Mill		12.1		12.0	12.8	13.5		11.5	11.7	12.3	12.1	11.7	12.4	12.8	12.4	13.5	12.6	13.3	
Av. Diff.**		-0.2		-0.2	-0.6	-0.2		-0.3	-0.2	-0.3	-0.6	-0.5	-0.3	0	-0.2	-0.7	-0.1	-0.1	
Max. Diff.***		-0.4		-0.4	-0.9	-0.5		-0.4	-0.4	-0.5	-0.6	-0.6	-0.6	-0.3	-0.3	-0.7	-0.3	-0.7	
<u>Caliber</u>																			
Institute		117		108	117	109		110	112	111	106	112	115	113	113	108	107	110	
Mill		117		107	113	106		109	112	109	101	115	115	115	114	109	106	111	
Av. Diff.**		0		-1	-4	-3		-1	0	-2	-5	+3	0	+2	+1	+1	-1	+1	
Max. Diff.***		+3		-3	-9	-8		-2	-2	-4	-8	+3	+8	+5	+4	+1	-3	+5	
<u>Bursting Strength</u>																			
Institute		334		300	302	348		328	307	338	309	363	341	307	332	381	356	329	
Mill		331		330	275	343		303	273	320	268	320	327	295	360	344	328	327	
Av. Diff.**		-3		+30	-27	-5		-25	-34	-18	-41	-43	-14	-12	+23	-37	-28	-2	
Max. Diff.***		-28		+40	-60	+38		-30	-53	-47	-57	-58	-34	-19	+60	-37	-40	+31	
<u>Tearing Strength, across</u>																			
Institute		388		382	366	391		386	354	376	375	413	380	375	388	413	375	362	
Mill		388		385	369	416		390	331	393	358	399	360	382	417	375	367	375	
Av. Diff.**		0		+3	+3	+25		+4	-23	+17	-17	-14	-20	+7	+29	-38	-11	+13	
Max. Diff.***		+30		+22	-19	+61		+1	-34	+47	-25	-23	-38	+30	+45	-38	-20	+27	

\* Comparison based on averages involved only those samples on which mill test data were submitted.  
 \*\* Average difference is the difference between the Institute mill average and the mill average based on mill test data.  
 \*\*\* Maximum difference encountered in comparing the Institute average and the mill averages for any sample submitted by that particular mill.

TABLE XXIV  
COMPARISON OF INSTITUTE-MILL DIFFERENCES BY PERIODS  
Average Difference, Per Cent

Mill	Period	Basis Weight	Caliper	Burst	Tear, in	Tear, across	Mill	Period	Basis Weight	Caliper	Burst	Tear, in	Tear, across
A	Current	--	--	--	--	--	K	Current	-2	-5	-5	-13	-5
	136th	--	--	--	--	--		136th	-0.7	-5	-5	-12	-3
	135th	--	--	--	--	--		135th	-0.5	-3	-4	-5	+4
B	Current	-1	-2	0	-0.9	0	L	Current	-3	+3	+3	-12	-3
	136th	-1	-0.8	+2	+0.6	+1		136th	-2	0	0	-9	-4
	135th	-1	-2	+2	+3	+6		135th	-0.9	-3	-0.9	-5	-2
C	Current	--	--	--	--	--	M	Current	-2	-2	0	-4	-5
	136th	-0.7	+0.8	-4	--	--		136th	-1	-3	-2	-5	-6
	135th	-3	-2	-4	--	--		135th	-1	-2	+2	-3	-2
D	Current	-2	-2	-0.9	+10	+0.8	N	Current	-3	0	+2	-4	+2
	136th	-1	-0.8	-0.9	+12	+4		136th	-2	-2	+6	+2	+5
	135th	--	--	--	--	--		135th	-2	-2	+4	+8	+6
E	Current	-3	-4	-3	-9	+0.8	O	Current	--	--	--	--	--
	136th	-2	-2	-0.9	-6	+0.8		136th	--	--	--	--	--
	135th	-2	-4	-3	-14	-3		135th	--	--	--	--	--
F	Current	-1	-1	-3	-1	+6	P	Current	-1	-2	+0.9	+8	+7
	136th	0	+2	-5	+1	+5		136th	-0.9	-2	0	+17	+12
	135th	0	-2	-15	-6	+9		135th	0	-4	+3	+8	+10
G	Current	--	--	--	--	--	Q	Current	-2	-5	+0.9	-10	-9
	136th	-0.7	-0.8	+2	+13	+13		136th	-0.7	-2	+2	-3	+3
	135th	-1	-3	-6	+12	+11		135th	-0.9	0	+6	-7	+2
H	Current	-2	-3	-0.9	-8	+1	S	Current	-1	-0.8	-0.9	-8	-3
	136th	-1	-0.8	0	-7	+2		136th	-2	-2	-3	-10	-2
	135th	0	+0.9	+0.9	-2	+5		135th	-2	-3	-0.9	-4	+0.3
I	Current	-0.2	-2	0	-11	-6	T	Current	+0.5	-0.7	+0.9	-0.6	+4
	136th	-0.2	-3	0	-23	-16		136th	+1	-1	-0.9	+6	+9
	135th	+0.2	-3	-0.9	-1	+0.8		135th	+0.7	-1	-0.9	+6	+5
J	Current	-2	-2	-2	-5	+5		Current	-2	-2	-2	-5	-2
	136th	-0.2	-4	+3	-0.3	+5		136th	-1	-1	-1	-1	-1
	135th	-0.9	-4	+3	-12	+0.8		135th	-1	-1	-1	-1	-1

It may be noted in Table XXIV that for the current period the largest average difference (per cent) between the average basis weight results of the Institute and those of a given mill on corresponding samples is three per cent. By comparison, the largest average difference (per cent) noted for the previous two periods was also three per cent. Further, it may be noted that the average basis weight result for Mill T was higher than that for the Institute, and the average results for the other mills were lower. The variations of 1 lb. or more for Mills E and L may be excessive.

The maximum variation in caliper for the current period is five per cent. This is the same as the maximum variation for the previous two periods. Compared with the Institute's results, the average test result for Mill N was the same, and the average test results for the other mills were lower. The variations of 0.5 point or more for Mills E, L, K, and Q may be excessive.

It may be noted in Table XXIV that the bursting strength results exhibited a maximum variation of five per cent for the current period. The average results for Mills L, N, P, Q, and T were higher than those for the Institute, the average results for Mills B, I, and M were the same, and the average results for the other mills were lower. None of the variations appear to be exceptionally large. Agreement between Institute and mill results is very good.

It may be seen in Tables XXIII and XXIV that the average machine direction tear results for Mills D and P were higher than those for the Institute, and the average results for the other mills were lower.

The maximum variation for the current period was thirteen per cent. Agreement between the Institute and mill results is good in most cases. However, several mills--namely, I, K, and L--are associated with differences greater than ten per cent which may be excessive.

With regard to the cross-machine direction tear results, it may be noted that the average results for Mills D, E, F, H, J, N, P, and T were higher than those for the Institute, whereas the average result for Mill B was the same, and the average results for the other mills were lower. The maximum variation for the current period was nine per cent. As in the case of the machine direction results, agreement between Institute and mill results is good.

The comparisons of Institute and mill data for individual sample lots are given in Tables XXV to XLIII for the various mills. In all the comparisons given in Tables XXV to XLIII, the Institute's test values have been used as the reference line.

COMPARISON OF INSTITUTE AND MILL DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958

TABLE XXV

MILL A -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Blumendorf Tear, g./sheet	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Across

No samples submitted

TABLE XXVI

MILL B -- 42-LB. LINERBOARD

180380	W.F.	10/26/58	2	43.8	43.1	-0.7	12.0	12.1	+0.1	117	117	0	323 <sup>a</sup>	332	+ 9	372 <sup>a</sup>	386	+14
180381	W.F.	10/26/58	2	43.4	43.2	-0.2	12.0	12.1	+0.1	118	117	-1	300	324	+24	350 <sup>a</sup>	380	+30
180424	W.F.	11/ 2/58	2	43.8	43.6	-0.2	12.1	12.1	0.0	121	119	-2	338	336	- 2	391 <sup>a</sup>	392	+ 1
180425	W.F.	11/ 2/58	2	44.1	43.6	-0.5	12.3	12.0	-0.3	121	119	-2	346 <sup>a</sup>	343	+ 2	417 <sup>a</sup>	400	-17
180475	W.F.	11/ 9/58	2	43.8	42.8	-1.0	12.4	12.0	-0.4	118	118	0	350 <sup>a</sup>	322	-28	403 <sup>a</sup>	387	-16
180476	W.F.	11/10/58	2	43.6	42.6	-1.0	12.3	12.0	-0.3	119	117	-2	343 <sup>a</sup>	322	-21	391 <sup>a</sup>	379	-12
180500	W.F.	11/16/58	2	44.1	43.5	-0.6	12.5	12.2	-0.3	113	116	+3	327 <sup>a</sup>	331	+ 4	398 <sup>a</sup>	390	- 8
180501	W.F.	11/16/58	2	44.0	43.7	-0.3	12.5	12.1	-0.4	112	114	+2	343 <sup>a</sup>	334	- 9	383 <sup>a</sup>	392	+ 9
Current Mill Average:				43.8	43.3	-0.5	12.3	12.1	-0.2	117	117	0	334	331	- 3	388	389	0

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XXVII

MILL C -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Across

No samples submitted

TABLE XXVIII

MILL D -- 42-LB. LINERBOARD

180376	WFLS	10/22/58	1	43.0	42.4	-0.6	12.2	12.1	-0.1	111	108	-3	308	348	+40	391 <sup>a</sup>	413	+22
180377	WFLS	10/27/58	1	43.3	42.6	-0.7	12.3	11.9	-0.4	107	106	-1	309 <sup>a</sup>	323	+14	383 <sup>a</sup>	373	-10
180378	WFLS	10/29/58	1	43.2	42.4	-0.8	12.1	11.9	-0.2	107	107	0	283 <sup>a</sup>	318	+35	372 <sup>a</sup>	369	-3
Current Mill Average:				43.2	42.4	-0.8	12.2	12.0	-0.2	108	107	-1	300	330	+30	382	385	+3

<sup>a</sup> This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XXIX

MILL E -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i.		Elmendorf Tear, g./sheet	
				IPC	Mill	Diff.	IPC	Mill	Diff.	In	Across
										IPC	Mill
180427	W.F.	10/20/58	1	43.2	42.0	-1.2	13.6	12.7	-0.9	297a	350
180428	W.F.	10/26/58	1	43.2	41.7	-1.5	13.0	12.4	-0.6	301a	365
180429	W.F.	10/27/58	1	43.2	42.4	-0.8	13.1	13.0	-0.1	311a	369
180430	W.F.	10/30/58	1	42.8	42.1	-0.7	14.2	13.3	-0.9	283a	377
180509	W.F.	11/ 3/58	1	43.5	42.0	-1.5	13.5	12.9	-0.6	325	377
180510	W.F.	11/ 6/58	1	42.5	41.8	-0.7	13.4	12.7	-0.7	289a	362
180511	W.F.	11/10/58	1	43.0	42.4	-0.6	12.9	12.9	0.0	301a	371
180512	W.F.	11/14/58	1	43.6	42.0	-1.6	13.3	12.8	-0.5	312	378
Current Mill Average:				43.1	42.0	-1.1	13.4	12.8	-0.6	302	369
										275	+ 3

TABLE XXX

MILL F -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i.		Elmendorf Tear, g./sheet	
				IPC	Mill	Diff.	IPC	Mill	Diff.	In	Across
										IPC	Mill
180375	W.F.	10/26/58	2	43.6	43.2	-0.4	12.8	12.9	+0.1	338	393
180379	W.F.	10/28/58	2	43.4	42.7	-0.7	13.3	13.3	0.0	345a	376
180414	W.F.	11/ 2/58	2	44.0	43.5	-0.5	14.0	13.7	-0.3	382a	436
180413	W.F.	11/ 4/58	2	44.0	44.0	0.0	13.8	13.7	-0.1	353a	419
180447	W.F.	11/ 8/58	2	44.4	44.0	-0.4	14.5	14.3	-0.2	323a	440
180507	W.F.	11/13/58	2	44.3	43.7	-0.6	13.8	13.3	-0.5	352a	433
180508	W.F.	11/14/58	2	43.9	43.6	-0.3	13.9	13.5	-0.4	344	415
Current Mill Average:				44.0	43.5	-0.5	13.7	13.5	-0.2	348	416
										343	+ 5

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.  
Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XXXI

MILL G -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. Edge		Elmendorf Tear, g./sheet	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Across

No samples submitted

TABLE XXXII

MILL H -- 42-LB. LINERBOARD

180462	W.F.	11/ 3/58	-	42.2	41.3	-0.9	11.4	11.0	-0.4	108	106	-2	310a	289	-21	373a	377	+ 4
180463	W.F.	11/ 9/58	-	44.2	43.5	-0.7	12.3	12.0	-0.3	112	112	0	346a	316	-30	399a	403	+ 4
Current Mill Average:				43.2	42.4	-0.8	11.8	11.5	-0.3	110	109	-1	328	303	-25	386	390	+ 4

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.



COMPARISON OF INSTITUTE AND MILL DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XXXIII

MILL I -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight,		Caliper, points		Bursting Strength, p.s.i. gage		In		Elmendorf Tear, g./sheet		Across	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Diff.	IPC	Mill Diff.
180371	W.F.	10/16/58	2	43.1	+0.1	12.0	11.6 -0.4	115	114 -1	318a	265	355a	-53	321	-34
180372	W.F.	10/16/58	2	43.4	-0.4	11.8	11.7 -0.1	113	112 -1	318a	277	355a	-41	323	-32
180373	W.F.	10/17/58	2	43.2	+0.1	11.7	11.6 -0.1	116	116 0	310a	277	349a	-33	349	0
180374	W.F.	10/17/58	2	43.0	-0.1	12.2	11.9 -0.3	114	113 -1	305a	285	359a	-20	330	-29
180471	W.F.	11/ 5/58	2	42.6	-0.4	11.8	11.6 -0.2	107	108 +1	303a	281	347a	-22	337	-10
180472	W.F.	11/ 5/58	2	42.1	+0.1	12.0	11.6 -0.4	110	108 -2	291a	254	359a	-37	327	-32
Current Mill Average:				42.9	-0.1	11.9	11.7 -0.2	112	112 0	307	273	354	-34	331	-23

TABLE XXXIV

MILL J -- 42-LB. LINERBOARD

180415	W.F.	10/ 3/58	1	42.9	-0.3	12.5	12.3 -0.2	106	109 +3	304a	313	350a	+9	397	+47
180416	W.F.	10/10/58	1	43.6	-0.6	12.7	12.2 -0.5	108	107 -1	337	300	369a	-37	368	-1
180417	W.F.	10/15/58	1	44.0	-0.6	12.5	12.5 0.0	114	110 -4	332	337	364a	+5	401	+37
180418	W.F.	10/15/58	1	44.3	-0.8	12.4	12.3 -0.1	111	110 -1	369a	322	415a	-47	403	-12
180419	W.F.	10/20/58	1	44.1	-0.7	12.5	12.2 -0.3	116	112 -4	344	329	381a	-15	403	+22
180420	W.F.	10/27/58	1	44.4	-1.0	12.7	12.2 -0.5	110	108 -2	341a	316	376a	-25	384	+8
Current Mill Average:				43.9	-0.7	12.6	12.3 -0.3	111	109 -2	338	320	376	-18	393	+17

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XXXV

MILL K -- 42-1B. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet								
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In		Across						
										IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.			
180382	WF1S	10/27/58	1	44.2	43.3	-0.9	13.0	12.4	-0.6	108	103	-5	308	274	-34	367 <sup>a</sup>	359	-8
180383	WF1S	10/27/58	1	43.9	42.3	-1.6	12.9	12.3	-0.6	104	100	-4	311	254	-57	361 <sup>a</sup>	342	-19
180464	WF1S	10/31/58	1	43.6	42.6	-1.0	12.6	12.1	-0.5	106	98	-8	291 <sup>a</sup>	260	-31	367 <sup>a</sup>	351	-16
180465	WF1S	10/31/58	1	44.1	43.0	-1.1	12.5	12.1	-0.4	104	97	-7	299 <sup>a</sup>	267	-32	370 <sup>a</sup>	353	-17
180523	WF1S	11/17/58	1	43.2	42.8	-0.4	12.4	12.0	-0.4	108	105	-3	327 <sup>a</sup>	277	-50	394 <sup>a</sup>	369	-25
180524	WF1S	11/17/58	1	43.3	43.2	-0.1	12.6	12.0	-0.6	104	102	-2	317	275	-42	391 <sup>a</sup>	373	-18
Current Mill Average:				43.7	42.9	-0.8	12.7	12.1	-0.6	106	101	-5	309	268	-41	375	358	-17

TABLE XXXVI

MILL L -- 42-1B. LINERBOARD

180466	W.B.	10/30/58	-	42.8	41.6	-1.2	12.0	11.5	-0.5	110	112	+2	349 <sup>a</sup>	291	-58	394 <sup>a</sup>	380	-14
180467	W.B.	10/31/58	-	44.3	43.3	-1.0	12.6	12.0	-0.6	114	115	+1	375	339	-36	417 <sup>a</sup>	396	-21
180468	W.B.	11/4/58	-	43.7	42.6	-1.1	12.8	12.2	-0.6	111	114	+3	372	336	-36	419 <sup>a</sup>	405	-14
180469	W.B.	11/3/58	-	43.1	42.2	-0.9	12.0	11.5	-0.5	109	112	+3	373	329	-44	420 <sup>a</sup>	417	-3
180489	W.B.	11/5/58	-	43.1	42.2	-0.9	11.9	11.5	-0.4	114	117	-	341 <sup>a</sup>	296	-45	405 <sup>a</sup>	391	-14
180490	W.B.	11/5/58	-	43.1	42.0	-1.1	12.2	11.7	-0.5	116	119	+3	365 <sup>a</sup>	328	-37	426 <sup>a</sup>	403	-23
Current Mill Average:				43.4	42.3	-1.1	12.2	11.7	-0.5	112	115	+3	363	320	-43	413	399	-14

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XXXVII

MILL M -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		In		Elmendorf Tear, g./sheet		Across	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.
180431	W.F.	11/ 5/58	-	44.8	+1.4	12.4	12.4	118	126	337 <sup>a</sup>	364	377 <sup>a</sup>	+27	372	- 5
180432	W.F.	11/ 6/58	-	45.4	-0.5	12.6	12.1	111	109	359 <sup>a</sup>	325	373 <sup>a</sup>	-34	349	-24
180433	W.F.	11/ 7/58	-	46.6	-1.4	12.8	12.2	123	124	379 <sup>a</sup>	351	394 <sup>a</sup>	-28	381	-13
180491	W.F.	11/12/58	-	43.5	-0.1	13.1	13.0	105	108	333 <sup>a</sup>	312	368 <sup>a</sup>	-21	347	-21
180492	W.F.	11/13/58	-	44.4	-0.5	12.9	12.7	119	119	329 <sup>a</sup>	321	376 <sup>a</sup>	- 8	351	-25
180493	W.F.	11/14/58	-	45.5	-1.8	12.9	12.8	120	122	344 <sup>a</sup>	312	395 <sup>a</sup>	-32	363	-32
180502	W.F.	11/19/58	-	42.4	-0.1	12.8	12.5	104	103	313 <sup>a</sup>	327	361 <sup>a</sup>	+14	349	-12
180503	W.F.	11/20/58	-	45.9	-3.4	12.3	11.9	122	115	339 <sup>a</sup>	311	401 <sup>a</sup>	-28	363	-38
180504	W.F.	11/21/58	-	44.4	-0.6	12.4	12.0	112	112	338 <sup>a</sup>	321	371 <sup>a</sup>	-17	365	- 6
Current Mill Average:				44.8	-0.8	12.7	12.4	115	115	341	327	380	-14	360	-20

<sup>a</sup>This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XXXVIII

MILL N -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet								
				IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.	In	Across				
180370	W.F.	10/16/58	1	44.2	43.9	-0.3	12.6	12.3	-0.3	110	113	+3	301a	286	-15	349a	334	-15
180411	W.F.	10/23/58	1	44.5	43.6	-0.9	13.0	12.9	-0.1	116	115	-1	308a	295	-13	386a	388	+2
180412	W.F.	10/28/58	1	44.8	43.2	-1.6	12.8	13.0	+0.2	112	117	+5	298a	295	-3	377a	407	+30
180421	W.F.	11/3/58	1	44.6	42.7	-1.9	12.9	12.8	-0.1	113	117	+4	318a	299	-19	385a	385	0
180513	W.F.	11/13/58	1	44.4	43.1	-1.3	12.9	12.9	0.0	112	115	+3	310	301	-9	377a	395	+18
Current Mill Average:				44.5	43.3	-1.2	12.8	12.8	0.0	113	115	+2	307	295	-12	375	382	+7

TABLE XXXIX

MILL O -- 42-LB. LINERBOARD

No samples submitted

<sup>a</sup> This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

## TABLE XI

MILL P -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i. gage			Elmendorf Tear, g./sheet					
				IPC		Diff.	IPC		Diff.	IPC		Diff.	IPC		Diff.	IPC		Diff.
				Mill	Diff.		Mill	Diff.		Mill	Diff.		Mill	Diff.		Mill	Diff.	
180368	W.F.	10/12/58	2	43.2	42.9	-0.3	12.4	12.2	-0.2	110	112	+2	323 <sup>a</sup>	357	+34	383 <sup>a</sup>	419	+36
180369	W.F.	10/23/58	2	44.2	43.0	-0.2	12.5	12.6	+0.1	108	112	+4	336 <sup>a</sup>	364	+28	369 <sup>a</sup>	414	+45
180445	W.F.	10/27/58	2	44.0	42.9	-1.1	12.4	12.3	-0.1	116	114	-2	348	334	-14	389 <sup>a</sup>	378	-11
180446	W.F.	10/28/58	2	43.8	42.9	-0.9	12.5	12.2	-0.3	118	114	-4	331	349	+18	386 <sup>a</sup>	424	+38
180505	W.F.	11/ 4/58	2	44.0	43.5	-0.5	12.5	12.2	-0.3	116	116	0	326 <sup>a</sup>	365	+39	395 <sup>a</sup>	429	+34
180506	W.F.	11/ 5/58	2	43.9	43.5	-0.4	13.3	13.0	-0.3	112	113	+1	329	389	+60	404 <sup>a</sup>	440	+36
Current Mill Average:				43.7	43.1	-0.6	12.6	12.4	-0.2	113	114	+	332	360	+28	388	417	+29

## TABLE XLI

MILL Q -- 42-LB. LINERBOARD

150426	W.	10/26/58	2	44.0	43.2	-0.8	14.2	13.5	-0.7	108	109	+1	381 <sup>a</sup>	344	-37	413 <sup>a</sup>	375	-38
Current Mill Average:																		
				44.0	43.2	-0.8	14.2	13.5	-0.7	108	109	+1	381	344	-37	413	375	-38

at. This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--NOVEMBER 1 THROUGH NOVEMBER 30, 1958 (continued)

TABLE XLII

MILL S -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		In		Elmendorf Tear, g./sheet	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.
180422	W.F.	10/14/58	-	42.8	-0.4	12.8	-0.3	105	106	355 <sup>a</sup>	315	375 <sup>a</sup>	355
180423	W.F.	10/14/58	-	44.2	-0.6	12.5	+0.2	109	106	357 <sup>a</sup>	341	381 <sup>a</sup>	379
Current Mill Average:				43.5	-0.5	12.7	-0.1	107	106	356	328	378	367

TABLE XLIII

MILL T -- 42-LB. LINERBOARD

180364	W.F.	9/28/58	2	42.9	+0.8	12.8	+0.2	116	114	346 <sup>a</sup>	328	373 <sup>a</sup>	400
180365	W.F.	9/29/58	2	43.8	+0.4	13.8	0.0	108	108	336 <sup>a</sup>	309	343 <sup>a</sup>	368
180366	W.F.	10/ 4/58	2	43.4	-0.9	13.2	+0.3	112	110	332	334	379 <sup>a</sup>	372
180367	W.F.	10/ 5/58	2	43.5	+0.2	13.7	+0.3	109	107	305	316	349 <sup>a</sup>	374
180473	W.F.	10/ 9/58	2	42.9	+0.8	13.0	-0.7	112	114	341 <sup>a</sup>	326	370 <sup>a</sup>	360
180474	W.F.	10/13/58	2	43.7	+0.3	13.6	-0.4	106	111	317 <sup>a</sup>	348	357 <sup>a</sup>	378
Current Mill Average:				43.4	+0.2	13.4	-0.1	110	111	329	327	362	375

<sup>a</sup> This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

THE INSTITUTE OF PAPER CHEMISTRY

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